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United States
Environmental Protection Agency
Solid Waste and
Emergency Response (5102G)

EPA/542/F-99/018

August 1999

EPA In Situ Permeable Reactive Barriers: Application and Deployment



Training Course

June 22-23, 1999
Boston, MA—completed

August 10-11, 1999
Seattle, WA—completed

September 21-22, 1999
Philadelphia, PA—completed

November 16-17, 1999
Dallas, TX—completed

February 8-9, 2000
Atlanta, GA

March 21-22, 2000
San Francisco, CA

May 2-3, 2000
New York, NY

June 13-14, 2000
Denver, CO

July 25-26, 2000
Chicago, IL

September 12-13, 2000
Kansas City, MO

Sponsored by:

U.S. Environmental Protection
Agency (EPA)
Technology Innovation Office (TIO)
National Risk Management Research
Laboratory (NRMRL)

Interstate Technology Regulatory
Cooperation (ITRC)

Remediation Technologies Development
Forum (RTDF)

In cooperation with:

Southern States Energy Board

United States
Environmental Protection Agency
National Service Center for Environmental Publications (NSCEP)
P.O. Box 42419
Cincinnati, OH 45242-2419

Official Business
Penalty for Private Use \$300

EPA/542/F-99/018

Preliminary Course Outline

Day One

- 8:15 Welcome and Course Description
- 8:30 Introduction to Permeable Reactive Barriers (PRBs) for Remediating and Managing Contaminated Groundwater In Situ
- 8:50 Collection and Interpretation of Design Data I: Site Characterization for PRBs
- 10:00 Reactive Materials I: Zero-Valent Iron
- 10:50 Collection and Interpretation of Design Data II: Laboratory and Pilot Scale Tests Design Calculations
- 11:35 Compliance Monitoring, Performance Monitoring, and Long-Term Maintenance for PRBs
- 12:00 Case Study Presentation - Working Lunch
- 1:00 Design Exercise
- 1:45 PRB Emplacement Techniques
- 4:00 PRB Permitting and Implementation
- 4:30 Summary of Day 1 and Open Discussion

Day Two

- 8:10 Questions and Open Discussion
- 8:15 Reactive Materials II:
- Non-Metallic Reactive Materials for Promoting PRB-Based Treatment
 - PRBs for Cr(IV) Groundwater Remediation
 - Treatment of Acid Rock Drainage
- These case studies will vary based on region.*
- 10:45 Economic Considerations for PRB Deployment
- 11:15 Wrap-up Discussion and Adjournment

Permeable Reactive Barriers Training Series
Attn: Gloyce Brackett
Southern States Energy Board
6325 Amherst Court
Norcross, GA 30092

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Trainers

Rich Landis is a Development Engineer for E.I. du Pont de Nemours and Company with over 19 years of engineering experience and participates on 3 RTDF Action Teams (PRB steering committee, Lasagna, and Sediments). For the past 8 years, he has focused on developing and applying in-situ, containment and sediment remedial technologies.

Robert Puls, Ph.D., Senior Soil Scientist, U.S. EPA, National Risk Management Research Laboratory. Dr. Puls is Chief of the Subsurface Remediation Branch, NRMRL-Ada, and Co-Chair of the RTDF Action Team on Permeable Reactive Barriers. Dr. Puls has more than 20 years of experience in environmental research and has been actively involved in permeable reactive barrier research and development since 1992.

Matthew Turner, Site Remediation Case Manager, New Jersey Department of Environmental Protection. Mr. Turner is the Team Leader of the ITRC Permeable Barrier Walls Team as well as an RTDF Steering Committee Member.

John Vidumsky, P.E., E.I. du Pont de Nemours and Company. Mr. Vidumsky is a Professional Engineer with 20 years of experience in the environmental services and chemical industries. He is currently with the DuPont Company's Corporate Remediation Group in Wilmington, DE. Mr. Vidumsky serves as the Industry Co-Chairperson of the RTDF Permeable Barriers Action Team, and is also active in the RTDF Bioremediation of Chlorinated Solvents Consortium.

John Vogan of EnviroMetal Technologies Inc. has been involved in research and commercial applications of permeable reactive barrier technology for the past eight years.

Scott Warner, Senior Hydrogeologist, Geomatrix Consultants, Inc. Mr. Warner is a California Certified Hydrogeologist and Engineering Geologist and RTDF steering committee member with more than 8 years of experience in permeable reactive barrier design and implementation.

Questions

If you have questions regarding this training course, please contact the following individuals:

Registration Questions: Cloyce Brackett or Kimberly Sams, Southern States Energy Board, by phone at 770-242-7712 or by e-mail to brackett@sseb.org.

Course Details: Brent Westfall, Coleman Federal, 208-375-2468 or e-mail to westfall@uswest.net or Scott Warner, Geomatrix Consultants, Inc., 510-663-4269 fax or e-mail to swarner@geomatrix.com

ADA Requests

If you have special needs and require auxiliary aids and/or services to fully participate in this seminar, please contact Lauren Lariviere at 781-674-7272 at least 4 weeks prior to the start date of your course.

Training Series Registration Form

In Situ Permeable Reactive Barriers: Application and Deployment

Please register me for the following training:

- | | |
|---|---|
| <input type="checkbox"/> February 8-9, 2000
Atlanta, GA | <input type="checkbox"/> June 13-14, 2000
Denver, CO |
| <input type="checkbox"/> March 21-22, 2000
San Francisco, CA | <input type="checkbox"/> July 25-26, 2000
Chicago, IL |
| <input type="checkbox"/> May 2-3, 2000
New York, NY | <input type="checkbox"/> September 12-13, 2000
Kansas City, MO |

Affiliation:

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> U.S. EPA | <input type="checkbox"/> Vendor |
| <input type="checkbox"/> Other federal agency | <input type="checkbox"/> Industry |
| <input type="checkbox"/> State agency | <input type="checkbox"/> Contractor |
| <input type="checkbox"/> Academia | <input type="checkbox"/> Other _____ |

Name _____

Title _____

Organization _____

Address/Mail Code _____

City/State/Zip Code _____

Telephone _____ Fax _____

E-Mail _____

Registration fee (check only one):

- ☐ Private Sector (early registration): \$450
☐ Private Sector: \$500
☐ Nonprofit: No Fee
☐ Government: No Fee

Please make checks payable to:
Southern States Energy Board
(Sorry, no credit cards accepted.)

Mail to:

SSEB
Attn: Cloyce Brackett
6325 Amherst Court
Norcross, GA 30092

Phone: 770-242-7712 Fax: 770-242-0421

Federal employees and private sector participants may register online via <http://www.trainex.org/prb>

Purpose

Permeable reactive barriers are one of the most exciting new developments in treating contaminated groundwater. Their rapid deployment has created a demand for more information on their effectiveness and cost as well as remaining implementation issues. EPA's National Risk Management Research Laboratory, Subsurface Protection and Remediation Division, and the Technology Innovation Office, in cooperation with the Remediation Technologies Development Forum and the Interstate Technology Regulatory Cooperation Work Group, have developed a 1 1/2-day training course on the use of permeable reactive barriers for remediating and managing contaminated groundwater. Training sessions were held in EPA Regions 1, 3, 6, and 10 during 1999 and will be held in the six remaining EPA regional cities during 2000.

Audience

The training course is designed to assist professionals in the regulatory community in overseeing the design, implementation, and monitoring of groundwater remedies that involve the deployment of permeable reactive barriers. Industry professionals and consultants will benefit from the updated technical information presented as well as the interaction with regulators and other professional colleagues.

Registration

Mail the attached registration form to SSEB, Attn: Cloyce Brackett, 6325 Amherst Court, Norcross, GA 30092

Fax the attached registration form to 770-242-0421

Federal employees and private sector participants may register via the Internet at <http://www.trainex.org/prb>

Fee and Cancellation Policy

Fees include a student manual, continental breakfast on both days, and a working lunch on Day One. Early registration fee is \$450. In order for you to qualify for this fee, we must receive your reply form and payment 6 weeks prior to the training session you are attending. The registration fee is \$500. The fee will be waived for government and nonprofit participants. If you must cancel, you will be refunded fully if you notify us 1 month prior to your session.

Seminar Agenda

The meeting will begin at 8:15 a.m. and adjourn at 5:00 p.m. on Day One. On Day Two the meeting will begin at 8:10 a.m. and adjourn at 12:00 noon. Preregistration will begin at 7:30 a.m. at each location. A detailed agenda will be provided in the confirmation package.

Workshop Space Limitation

Space available is limited to 150 participants: 50 slots will be reserved for private sector registrants and 100 slots reserved for nonprofit registrants and registrants from state and federal agencies.

Hotel Information

A block of rooms has been reserved at each of the following hotels. These rooms will be issued on a first-come, first-served basis and held until the cutoff dates indicated below. Reserve rooms directly with the hotel, and reference the "EPA PRB Seminar" to receive the special room rate.

Training Course Locations

Atlanta, GA February 8-9, 2000

Sheraton Colony Square

188 14th Street NE

Atlanta, GA 30361

404-892-6000

Cutoff date for reservations: January 10

Rate: \$90 single/double (plus 14% tax)

San Francisco, CA March 21-22, 2000

Radisson Miyako Hotel

1625 Post Street

San Francisco, CA 94115

415-922-3200

Cutoff date for reservations: February 20

Rate: \$129 single/\$149 double (plus 14% tax)

New York, NY May 2-3, 2000

The Roosevelt Hotel

Madison Avenue at 45th Street

New York, NY 10017

212-661-9600

Cutoff date for reservations: April 14

Rate: \$195 single/double (plus 13.25% tax and \$2 city fee)

Denver, CO June 13-14, 2000

Holiday Inn Denver Downtown

1450 Glenarm Place

Denver, CO 80202

303-573-1450

Cutoff date for reservations: May 15

Rate: \$80 single/double (plus 11.8% tax)

Chicago, IL July 25-26, 2000

The Ambassador West

1300 North State Parkway

Chicago, IL 60610

312-787-3700

Cutoff date for reservations: June 23

Rate: \$104 single/\$124 double (plus 14.9% tax)

Kansas City, MO September 12-13, 2000

Westin Crown Center

One Pershing Road

Kansas City, MO 64108

816-474-4400

Cutoff date for reservations: August 14

Rate: \$85 single/\$115 double (plus 12.6% tax)

Please note: room rates are based on the federal government per diem and are subject to change if the per diem changes. Tax rates are also subject to change.